R18 Regulation *Subject code:2E6CB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VI Semester Supplementary Examinations, April 2026

THERMAL ENGINEERING - II

(ME)

Maximum Marks: 70 Date: 13.04.2026 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	BTL
1	Mention various processes in a Rankine Cycle.	2M	1	L1
2	List the various factors considered for the selection of Boilers.	2M	1	L1
3	Write various types of Steam nozzles.	2M	2	L1
4	What is meant by Wilson Line?	2M	2	L1
5	Mention the classification of Steam Turbines.	2M	3	L1
6	Write the principle of working of an Impulse Turbine.	2M	3	L1
7	Write the function of a Steam Condenser.	2M	4	L1
8	Write the classification of Gas Turbines.	2M	4	L1
9	What is the working principle of Jet propulsion?	2M	5	L1
10	Write about the Thrust power.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	A simple Rankine cycle steam power plant operates between the temperatures of 260^0C and 95^0C. The steam is supplied to the turbine at a dry saturated condition. In the turbine it expands in an isentropic manner. Determine the efficiency of the Rankine cycle operating between these two temperature limits.	10M	1	L2
	OR			
12	Discuss the heat re-heat Rankine cycle and write its advantages.	10M	1	L2
13	Derive an expression for the mass of steam discharged through a Nozzle.	10M	2	L2
	OR			
14	Dry saturated steam at a pressure of 15bar enters in a nozzle and is discharged at a pressure of 1.5bar. Find the final velocity of steam, when the initial velocity of the steam is negligible. If 10% of the heat drop is lost in friction, find the percentage reduction in the final velocity.	10M	2	L2
15	Why are steam turbines compounded? Explain.	10M	3	L2
	OR			

16	The steam leaves the nozzle of a single row impulse turbine at 900m/s. The nozzle angle is 20^0 and blade angles are 30^0 at inlet and outlet. Calculate the blade velocity and work done per kg of steam. Assume the flow over the blade is frictionless.	10M	3	L2
17	Write the merits and demerits of gas turbine plant over internal combustion engines?	10M	4	L2
	OR			
18	The data refers to a test of surface condenser of a steam turbine. Absolute pressure of the steam entering the condenser is 5.628kpa, temperature of condensate leaving the condenser is 32^0C, inlet temperature of cooling water is 15^0C, outlet temperature of cooling water is 30^0C and mass of cooling water per kg of steam is 32kg.Assuming that all the heat lost by the exhaust steam is taken up by the circulating water, determine the dryness fraction of the steam as it enters the condenser.	10M	4	L2
19	Explain the air breathing and non air breathing propulsion systems.	10M	5	L2
	OR			
20	The effective jet velocity from a rocket engine is 3000m/s. The forward velocity is 1500m/s and propellent consumption is 80kg/s. Calculate the thrust, thrust power, and propulsive efficiency.	10M	5	L2